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ABSTRACT

A major activity of any ESEA Title III project is evaluation. This paper suggests evaluation methods especially appropriate tc such projects by applying a systems approach to the evaluation design. Evaluation as a system is divided into three subsystems: (1) baseline evaluation, which describes conditions as they exist before project treatment; (2) process evaluation, which provides infcrmation to aid decisionmaking in day-to-day operational activities; and (3) product evaluation, which measures the extent to which a set cf project objectives has been met. These three evaluation methods provide information to facilitate decisionmaking during the course of the project, instead of postponing evaluation until after ccmpletion of the project. This type of continuous evaluation system should be an important part of any innovation program. (Figure 4 on page 30 may reproduce poorly because of marginal legibility.) (RA)

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A SYSTEMS APPROACH
TO THE DEVELOPMENT OF AN EVALUATION SYSTEM
FOR ESEA TITLE III PROJECTS

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Submitted to

Dr. Gregory Trzebiatowski

In Partial Fulfillment of

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"SYSTEMS CONCEPTS IN EDUCATION"

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by

MARLEN YOST
FRANK J. MONNIN

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EA 003 263

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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INTRODUCTION

The purpose of this study is to develop an evaluation system with specific application to projects approved and funded under Title III of the Elementary and Secondary Education Act of 1965. This evaluation system has within itself sufficient flexibility to provide for differences among the various projects subsumed under Title III ESEA. At the same time it is rooted in the scientific method of investigation and is developed by using the systems approach.

One specific objective of this study is to develop a valid rationale for systematic evaluation and subsequently place it in perspective with other project-related activities. Evaluation for ESEA Title III projects is depicted as a set of subsystems forming part of a larger system --- the project. Another objective of this study is to illustrate how the system approach can be applied effectively and logically to the evaluation of ESEA Title III projects and all project-related activities.

Three distinct subsystems for evaluation are developed and woven together into the larger system. These three phases of evaluation are baseline evaluation, process evaluation, and product evaluation. As these three subsystems are expanded in the study, their interrelatedness is established in view of the total project, that is, in relation to the entire spectrum of project-related activities and objectives.

Evaluation or evaluative research is still in the questionable or developmental stages in many realms of education. It is shown, however, that several unique characteristics of Title III activities tend to provide a reasonable basis for evaluative research and effective evaluation strategies.

I. ESEA TITLE III PROJECTS

Project Proposal and Application

Title III of the Elementary and Secondary Education Act of 1965 requires that every initial project application contain an evaluation plan or strategy as an integral part of the proposal. When developed and implemented, these evaluation efforts should enable the applicant agency to ascertain the degree to which project objectives have been met. That is, these efforts should yield timely and relevant information for use by decision makers, information that shows the extent to which project-related activities (treatment) were effective in achieving objectives of the project.

Furthermore, in subsequent applications for second and third grant awards the applicant agency must submit a report which displays the results of evaluation efforts. This report likewise is to include proposed revisions in the original evaluation plan or strategy affecting the remaining portion of the project.

Project Evaluation Reports

A written evaluation report must be submitted by each project at the end of each grant period. General guidelines for such reports are as follows:

First End-of-Grant Report

This report should be submitted 60 days prior to the end of

the first grant period along with the application for the first continuation grant. Primary consideration in the report should be given to changes which have occurred as a result of project-related activities during the first grant period. The goals of the report should be:

(1) To present the results of Baseline evaluation which has taken place during the first year of project operation and which describes the context within which first year activities have taken place;

(2) To specify the steps taken to meet project objectives; and

(3) To describe as clearly as possible the degree to which project objectives were achieved during the first year of project operation.

Second End-of-Grant Report

This report should be submitted 60 days prior to the end of the second grant period along with the application for the second continuation grant. Because project goals, objectives and activities often cannot be categorized on the basis of yearly grant periods, the second end-of-grant evaluation report should be cumulative. Thus, the goals of the report should be (1) to present the results of any Baseline Evaluation which has taken place during the second year of project operation and which is relevant to second-year activities; and (2) to describe as clearly as possible the cumulative effects of the project in terms of all activities which have taken place, and all objectives which have been met during the first two years of project operation.

Project Termination Report

This report must be submitted along with the end-of-project budget report no later than 90 days following the project termination date. Again, because project goals, objectives and activities cannot be categorized on the basis of yearly grant periods, the project termination report should be cumulative and should take into consideration all project objectives and all activities undertaken to meet those objectives for the entire duration of the project. The primary goal of the report should be to present, in the light of information gained from Baseline Evaluation, a full and clear picture of both successes in meeting project objectives and failures to meet project objectives. Needless to say, termination reports in which only project successes are presented, in which project successes are couched in unrealistic terms, or in which project failures are buried in euphemisms, do a great disservice to the progress of educational research and development.

Projects lasting for three years are required to submit First and Second End-of-Grant Reports as well as a Project Termination Report. Projects lasting for two years are required to submit the First End-of-Grant Report and Project Termination Report. Projects lasting for one year are required to submit a Project Termination Report only. All project evaluators are encouraged to include in their records documentations summarizing evaluation activities at three to six month intervals. Such summaries greatly facilitate both the project decision-making process and the writing of required evaluation reports.

Suggested Format and Considerations for Content in Title III Reports

Written evaluation reports should always reflect as completely as possible both the project evaluation strategy and the outcome of application of that strategy. In effect, this means that the format of each evaluation report should be carefully developed in relationship to specific project evaluation activities and outcomes such that all of those activities and outcomes are included in the report. Thus, the following list does not represent a definitive format for every Title III project evaluation report. It does, however, present some of the basic considerations germane to most evaluation reports. Writers of Title III project evaluation reports are cautioned not to use the list as a format for their reports, but to consider the list carefully from the point of view of a meaningful organization of the content in their reports.

A. Research Results

1. Define the scope of evaluation efforts in relation to project objectives.

2. Describe the general research design--this is, provide an overview of the schedule of events which constitute research efforts.

3. Describe instruments used to collect data. Include in the Appendix to the report a copy of all instruments used, except standardized tests.

4. Discuss statistical procedures and methods. Include in the Appendix all tabulated raw data relevant to statistical computations presented in the body of the report.

5. Discuss the results of the evaluation study in terms of educational and statistical significance as related to project objectives.

6. Present conclusions of the evaluation study and recommendations for future activities and studies.

B. Personnel Responsible for Project Evaluation

1. Describe the qualification responsibilities of all consultants providing evaluation services to the project.

2. Discuss the extent and kind of involvement for all those who are participating in project evaluation.

C. Difficulties Experienced During the Course of Project Evaluation

1. Describe any difficulties encountered in developing a project evaluation strategy.

2. Describe any limitations and constraints relevant to data collection, analysis and interpretation.

3. Discuss any difficulties relating to availability/qualifications of personnel needed for participating in project evaluation activities.

4. Discuss or describe any other difficulties relevant to evaluation of your project.

D. Effectiveness and Efficiency of Research Efforts in Relationship to Project Objectives

1. Discuss the extent to which research efforts have provided useful information relevant to the impact of the project on students involved, (1) on participating staff members, and (2) on the community or area in which the project took place.

2. Determine if the information provided through the evaluation efforts justifies the expenditure for those efforts. If more funds should have been provided for evaluation efforts, or if more funds will be needed during the next grant period, describe the reasons.

3. In light of project results to date, discuss evidence that indicates whether current project objectives should or should not be pursued during the rest of the project (for First and Second End-of-Grant Reports only).

4. Report total estimated expenditures for evaluation efforts. Major resources and activities include:

(a) Project evaluation staff;

(b) Consultants both from the school district (or districts) served by the project and from other sources;

(c) Materials, including cost of standardized tests and other instruments;

(d) Contracts for statistical analysis of data; and

(e) Other resources and activities.

II. EVALUATION OF ESEA TITLE III PROJECTS

Every Title III project is managed by a project director and a team of specialists who must frequently make decisions regarding resources used and activities undertaken to meet project objectives. To make the most effective and fruitful decisions, and thus to provide the best possible assurances for project success, the project director and his team of specialists must obtain, maintain and interpret accurate, up-to-date bodies of information relevant to project design, project development, project implementation and project successes/failures.

Evaluation Defined in Context of Title III Projects

The process of gaining and interpreting such information is termed "evaluation". More accurately, evaluation may be defined as the process of delineating, collecting and interpreting information for distribution to those involved in the decision-making process.

Delineating refers to outlining parameters for information to be collected. Such outlining should clearly specify the kinds of data being sought in terms of content, scope, reliability, validity, and appropriateness and relevancy of source.

Collecting refers to gathering and compiling all available data from established parameters with precision and in useable form.

Interpreting refers to explaining the statistical and educational significance of collected data in a form that is understandable by those to whom the report is directed.

Distribution refers to providing appropriate and necessary written reports to those involved in the decision-making process.

General Evaluation Functions and Categories

Although detailed procedures for evaluation will vary widely from project to project, it is possible to outline a set of general evaluation functions which are apropos to every Title III project. The functions fall into three categories: Baseline Evaluation, Process Evaluation, and Product Evaluation. It should be observed here that the delineating, collecting, interpreting and distributing activities explained in the definition given above apply to each functional category within the overall evaluation process, so that an outline of general evaluation strategy might be developed around the following framework:

Delineate Collect Interpret Distribute	Baseline Evaluation	
Delineate Collect Interpret Distribute	Process Evaluation	Overall Evaluation Process
Delineate Collect Interpret Distribute	Product Evaluation	

Baseline Evaluation

The first procedure in an overall evaluation strategy should be Baseline Evaluation. Baseline Evaluation may be defined as the delineation, collection, interpretation and distribution of all information needed (1) to establish data bases which provide input into needs assessment activities (those activities which result in a clear knowledge of the educational needs of the agency in which a Title III project will be developed); (2) to provide a benchmark against which to measure future successes/failures of project activities; and (3) to furnish data for identifying, describing and defining the context within which change is expected to occur as a result of project activities. In effect, Baseline Evaluation provides that kind of information without which it would be impossible to measure any progress made toward meeting project objectives. Such information describes conditions as they exist before project treatment; and unless these conditions are accurately described before project implementation, it will be impossible to describe changes effected by project implementation. Baseline Evaluation is, therefore, essential to the overall evaluation process; and every care should be taken to insure that information gained during the Baseline Evaluation process is valid, appropriate and well documented.

Process Evaluation

After the project has been initiated, simulated or implemented, and throughout the course of the project, management will have to

make many important decisions regarding project resources and activities. The function of Process Evaluation is to aid management in making day-to-day operational decisions. Essentially, Process Evaluation may be defined as the delineation, collection, interpretation and distribution of information needed to make decisions which will keep project resources and activities directed toward fulfilling project objectives. Thus, Process Evaluation assesses the fulfillment or non-fulfillment of those key steps which, having been carefully planned during project development, are being taken to meet project objectives. The result of such assessment should be to make decisions regarding subsequent courses of action to be taken, and resources to be used, toward fulfillment of project objectives.

Product Evaluation

As planned steps to meet an objective or set of objectives near completion, project management should be prepared to undertake Product Evaluation. Product Evaluation may be defined as the delineation, collection, interpretation nd distribution of information needed to determine (1) whether or not a project objective or set of objectives has been met, and (2) the extent to which a project objective or set of objectives has been met. Information resulting from Product Evaluation should permit project management to gain a clear overview of project progress in terms of project objectives. For this reason, due consideration from the very outset of project design and development should be given to stating

project objectives in measurable terms. The less measurable project objectives are, the less probable it will be that effective Product Evaluation can take place; and, unless effective Product Evaluation can take place, project management will have no rational foundation on which to base those key decisions which will affect the success or failure of the project as a whole, as well as the continuation of the project, either in part, or as a whole.

Role of Evaluation in ESEA Title III Projects

The following points should be taken into consideration with regard to evaluation of Title III projects:

1. Evaluation is an ancillary process: the main purpose is to provide project management with accurate information so that management can make critical decisions regarding project resources and activities. Evaluation is not the decision-making process itself; rather, it is a service which facilitates the decision-making process.

2. Baseline, Process and Product evaluation procedures should be scheduled in proportional importance with major project activities so that the evaluation strategy can be developed in a reasonable perspective with the project, and not vice-versa. At no time should evaluation become the dominant activity of the project.

3. Finally, careful consideration should be given to the format of every evaluation report to insure that all activities which have taken place and all objectives which have been met during the period covered by the report are appropriately presented in the report.

III. EVALUATION IN PERSPECTIVE WITH OTHER PROJECT RELATED ACTIVITIES

Figure 1 attempts to place Baseline, Process and Product Evaluation in perspective with other major project activities. Project-related activities are numbered from 1 to 17.2 to indicate activity flow over time. Figure 1 by no means depicts the relationship between all evaluation activities and all major project activities. For the purposes of proposal development and the development of an evaluation strategy, however, the model does in general indicate the role and place of Baseline, Process and Product Evaluation activities. This model of an evaluation system for ESEA Title III projects portrays evaluation activities as three major subsystems, each consisting of a block of project-related activities, forming part of the overall Title III Project System and fitted within the sequentially related activities of the entire project.

In developing this model several different models and descriptions of the "systems approach" were utilized, including the"Model of Systematic Approach to System Development" of R. C. Hopkins (Figure 2), the "Model of General Steps in Problem Solving Using System Analysis Tools" of Corrigan and Kaufmann (Figure 3), and the "Model of the Systems Approach" used by Launor Carter (Figure 4). Each of these models will be used later in the section of this study devoted to an evaluation of the model given in Figure 1. For our present purposes, however, let us "take a walk through" Figure 1 by relating the steps outlined in this model to the steps

involved in a systematic approach to system development, as indicated by R. C. Hopkins in Figure 2. This approach will enable the reader to see the "systems" terminology couched behind each of the labeled and sequential steps in the development of project-related activities in Figure 1.

Baseline Evaluation Subsystem

Activity 1 in Figure 1 consists of recognizing that objectives set by the local educational agency are not being met. This recognition is based on the answers given to the fundamental question, "What is the local educational system supposed to do and why?" The answers to this question comprise a list of the needs to be fulfilled by the LEA system, the uses to which the LEA system is put, and the purposes for the existence of the LEA system. This list is then analyzed for duplications, similarities, analogies with other systems, nonpertinent items, state-of-the-art implications, and fundamental meanings and relationships.

Activity 2 constitutes the first formal step of Baseline Evaluation -- that is, the determination of specific problems and needs resulting from lack of fulfillment of objectives. Such determination should be made on the basis of available data which have been delineated, collected, interpreted and distributed in accordance with the definition of Baseline Evaluation given above. In other words, the functional objectives of the LEA system are synthesized, by way of induction, from the analyzed list of uses, needs and purposes of the LEA system.

Once a determination of problems and needs (needs, uses and purposes synthesized into functional objectives) has taken place, Activity 3 can be undertaken. Essentially this activity consists in comparing the needs of the local educational agency with an existing list of state critical needs for the purpose of determining eligibility for Title III funds.

Should the LEA be eligible for Title III funds, Activities 4 and 5 can take place. Determining the strategy for treatment comprises the development of conceptual and specific requirements for the LEA system, as well as the expansion of the specific (performance) requirements by the development of quantitative specifications for these specific requirements. The conceptual requirements for the LEA system are developed by answering the question, "What does the system have to do to fulfill its objectives?". The specific (performance) requirements for the LEA system are developed through an expansion of each conceptual requirement by asking, "What does the system specifically have to do in a detailed physical (or other appropriate) sense in order to fulfill that requirement?". These specific performance requirements developed for the LEA system correspond to the specific design requirements in weapon systems, computer systems, etc.

The detailed requirements are then grouped together into subsystems or components. The subsystems are developed by successive partitioning until manageable chunks can be assigned to particular design and development groups. This activity greatly facilitates an analysis and derivation of structure and techniques and of

detailed design of the LEA system, all of which should eventuate in the development of an initial proposal that contains (1) a well-balanced overall and preliminary conceptual design of the LEA system, and (2) sufficiently quantified and measurable objectives upon which to base an effective evaluation of the project.

Activity 5 in Figure 1 is especially important, for it is at the stage of project development that measurable objectives for the project should be formulated. It is, after all, the intrinsic value of efforts included in Activity 5 that will determine the approval or disapproval of the entire project.

Activities 3 and 6 of Figure 1 correspond to environmental considerations in the sequence of steps involved in Hopkins systematic approach to system development. The physical, legal, organizational, sociological, psychological and economic environments surrounding the LEA must be taken into consideration in the overall project proposal development. More specifically, it is the economic environment of Title III funding, along with a comparison of the needs of the LEA with an existing list of state critical needs, that determines eligibility for project funding under Title III (Activity 3) and approval of the project proposal (Activity 6).

After the proposal has been approved, the establishment of Baseline information can continue. Baseline information, in the context of Activity 7, is that information which provides benchmarks against which to measure successes/failures of project activities. Activity 7 can be compared to the modeling, simulating

and testing of the preliminary and conceptual design of the system. In conjunction with all activities to this point, Activity 7 comprises the first major evaluation, feedback, and modification loop in the entire sequence of activities undertaken. More specifically, as Figure 1 indicates, Activities 2 and 7 together comprise Baseline Evaluation, which, in terms of the Hopkins model (Figure 2), includes all activities from the original listing of uses, needs and purposes to the modeling, simulating and testing of the LEA system design (See Figure 5).

Such information as that contained in Baseline information should be collected and documented before any attempt is made to fulfill project objectives. Although several activities occur between Activities 2 and 7, and although Activity 7 may occur during a project at any time just prior to the initiation of planned steps to fulfill an objective, Activities 2 and 7 constitute Baseline Evaluation.

Process Evaluation Subsystem

When Baseline information has been established such that there exist benchmarks against which to measure the first major set of project activities, refinement of the strategy for treatment (Activity 8), project implementation (Activity 9) and execution of steps to fulfill project objectives (Activity 10) can take place. Activities 9 and 10 should have been well-planned during proposal development; and, as each step is taken, it should be assessed to

determine if the outcome is desirable or undesirable in terms of progress made toward meeting objectives. Methods of determining the outcome of each step taken will vary widely but should, in all cases, provide that kind of information which, when compared with Baseline information, will make it possible to determine whether or not the outcome of the step is desirable. As indicated in Figure 1, Activity 11 and Decision 12 constitute Process Evaluation. Should the outcome be undesirable (Activity 13.1) the step can be modified, executed and re-evaluated until the desired outcome is attained or until other previously planned steps are undertaken. Should the outcome be desirable (Activity 13.2) the next planned step to meet objectives can be undertaken and this cycle can continue until completion of the planned steps to meet objectives.

Activity 8 of Figure 1 corresponds to the activities of subsystem development, subsystem conceptual design, component design, and system design finalization and integration, as defined in the Hopkins model (Figure 2). Activity 9 (implement project) and Activity 10 (execute steps to fulfill objective(s)) do not appear in the Hopkins model as such. In actuality these activities represent implementation of the project by the successive execution of the steps necessary to fulfill project objectives prior to any Process Evaluation.

Activity 11 and Decision 12 of Figure 1 comprise system testing in the Hopkins model. As such they constitute the second major evaluation, feedback and modification loop in the sequence of activities undertaken relative to Title III project development.

As a matter of fact, Activity 13.1 of Figure 1 is implied in Process Evaluation, for it involves any modification required as a result of Process Evaluation.

Product Evaluation Subsystem

Upon completion of all planned steps to meet a given objective or set of objectives, it will be necessary to determine the extent to which the objective(s) have been met (Activity 14). Taken together, Activity 14 and Decision 15 of Figure 1 constitute Product Evaluation. Should the objective(s) be met to the satisfaction of project management, planned project activities can continue (Activity 16.2) and activities undertaken to meet the objective(s) should continue for the purpose of validating initial outcome of product evaluation (Activity 16.3).

Should the objectives not be met, management must decide either to repeat or not to repeat activities relevant to the unmet objective(s) (Decision 16.1). A decision not to repeat such activities will bring about the necessity of preparing for future project activities in light of the fact that one or more of the project objectives have been terminated (Activity 17.1). A decision to repeat such activities calls for consideration of both modification of the present project strategy and formulation of alternatives for future project activities (Activity 17.2).

Activity 13.2 in Figure 1 corresponds to system implementation in the Hopkins model. Activities 14 through 17.2 in Figure 1 are not depicted in the Hopkins model at all. Activity 14 and Decision 15 of Figure 1 comprise testing and evaluation of the entire system

after it has been implemented, a testing of the implemented system and overall evaluation of the system as implemented. This final and major evaluation, feedback and modification loop is not shown in the Hopkins model, but it is this loop that constitutes final product evaluation (See Figure 5). In the Hopkins sense, this evaluation, feedback and modification loop would consist of an analysis of the existing system as a part of the preliminary steps in the systems analysis spectrum of activities.

Interrelationships Among Evaluation Subsystems

The preceding discussion pointed out (1) that evaluation may be protrayed as a set of subsystems forming part of a larger system, namely, the spectrum of activities included in Title III project proposal, approval and development, and (2) that the three identified evaluation subsystems in fact constitute three major feedback and modification loops. Figure 3 consists of a model of the general steps in problem solving using system analysis tools as proposed by Corrigan and Kaufmann in their paper entitled, The Tools and Steps of the System Approach to Education prepared for Operation PEP participants. As this model clearly indicates, evaluation actually occurs, or should occur, at each and every step in the design, development and engineering of any system. To indicate this fact of continuous and continued evaluation activities in Figure 1, however, would have rendered the model in Figure 1 entirely too complex and unwieldy for its projected users. Although Figure 1 does not pictorially display the continuing nature

of evaluation activities, it is hoped that the discussion has brought this aspect of evaluation to light.

Figure 1 shows Baseline Evaluation as consisting solely of Activities 2 and 7; the discussion, however, indicates that Baseline Evaluation, in reality, includes all project-related activities from Activity 1 through Activity 7. Similarly, Figure 1 shows Process Evaluation as consisting solely of Activity 11 and Decision 12; again, however, the discussion explains that Process Evaluation in fact includes Activities 8 through 13.1. The same is true for Product Evaluation, which Figure 1 indicates as including Activity 14 and Decision 15 only. Realistically, however, Product Evaluation includes all project-related activities from Activity 13.2 to Activity 17.2. Thus, from this discussion, it is clear that evaluation activities in connection with Title III projects do occur as a continuous function over the sequential time-related activities involved in Title III project development, and that the evaluation subsystems in Figure 1 are highly integrated within the sequence of activities and with each other.

Furthermore, although evaluation activities must occur at each and every stage of system design, system development and system implementation, it is true that there are certain points in this sequence of activities that can be termed "major evaluation, feedback and modification loops". Although the model in Figure 1 does not portray this fact vividly, again the discussion above confirmed the fact that the three identified evaluation subsystems do represent three major evaluation, feedback and modification loops.

Whereas the Corrigan & Kaufmann model (Figure 3) emphasizes the continuing nature of evaluation activities, it does not indicate where major evaluation activities should occur. Figure 4, which represents another model of the systems approach, does indicate to a greater extent that feedback to previous steps to investigate the possibility of revising needs, objectives, constraints, alternatives and implementation methodologies can and should occur at certain strategic points in the development of a system.

In the previous discussion it was indicated that the three evaluation subsystems, representing major evaluation, feedback and modification loops, could be identified and related to certain steps in the Hopkins model quite readily. Specifically, Baseline Evaluation was shown to correspond to the "Modeling, Simulating and Testing of System Design"; Process Evaluation was shown to correspond to "System Testing"; and Product Evaluation, as was indicated, does not show up in the Hopkins model, but would occur after "Implementation". In short, Baseline Evaluation, Process Evaluation, and Product Evaluation correspond quite clearly to what might be called "Testing Preliminary System Design", "Testing Integrated System", and "Testing and Evaluating the Implemented System" in Hopkins' terminology.

Summary and Conclusions

Evaluation of the Model of the Evaluation System for ESEA Title III Projects

How well does Figure 1 provide a sound theoretical basis for the evaluation of Title III project development? How well does it

describe and explain evaluation in the perspective of Title III project activities? After all, these are the primary purposes of any model, namely, to describe, explain, and provide a sound theoretical basis for the system being modeled. How well does Figure 1 meet the objectives and purposes for which it was developed and which were set forth in the introduction to this study?

Clearly, Figure 1 does not coincide step-by-step with any of the models developed for a systems approach to system development. In other words, there is not a one-to-one relationship between the 17.2 steps in Figure 1 and the steps delineated in the Hopkins model or any of the other models. This does not mean, however, that the correspondence between Figure 1 and other system models is thereby minimized. Actually, Figure 1 relates very well with most other systems approach models.

Figure 1 clearly indicates the general role and position of the three evaluation subsystems within the overall context of Title III project development activities. It further relates the three evaluation subsystems to each other, as indicated in the previous section of this study. Although Figure 1 appears to be highly linear and sequential in nature, reflecting the sequential aspect of project-related activities, this appearance is due primarily to the fact that the intended users of this model (Title III project evaluators) clearly need a model that structures and organizes project-related activities sequentially. Obviously, as is clear from an examination of Figure 3 and Figure 4, project evaluation, like any other evaluation system, involves a highly interactive organization of activities, many of

which in turn are highly iterative in nature. As indicated earlier, to have specified the truly interactive and iterative nature of project evaluation would have complicated Figure 1 to such an extent as to render it too cumbersome for its intended users.

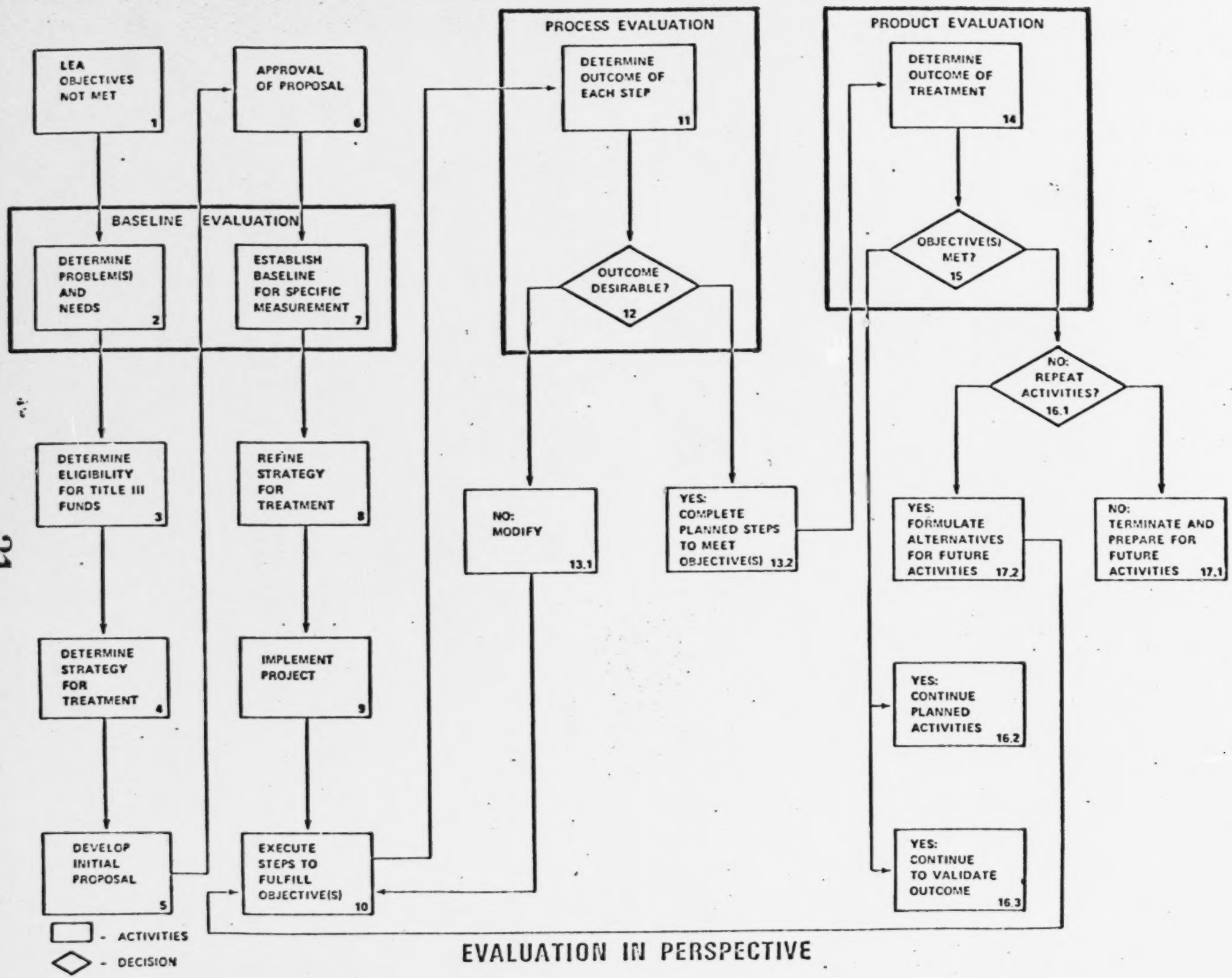
Rational Basis for Effective Evaluation of Title III Projects

As mentioned in the Introduction to this study, evaluation or evaluative research is still in the questionable and developmental stages in many realms of education. There are several unique characteristics of Title III projects, however, which tend to provide a reasonable basis for effective evaluation strategies and thus for evaluative research. One of these characteristics is the fact that one prerequisite for any Title III project is that there be clearly defined objectives. These objectives, furthermore, must be behavioral in nature and truly measurable. Thus, through a clear delineation of the rudimentary elements of the project the foundation and necessary framework for subsequent evaluation is established.

Secondly, all Title III projects are supposed to be innovative/exemplary. This aspect tends to differentiate Title III programs from on-going or traditional programs. It further places more emphasis on the evaluative aspects or activities associated with the project, for any innovative or exemplary project/system must necessarily be subjected to more rigid evaluation procedures.

A third characteristic of Title III projects that tends to provide a rational basis for evaluation of these projects is that

definite parameters are established in terms of the length of projects, with a maximum length of thirty-six months, in terms of funding approved for the project, and other limiting constraints that are clearly known by the project evaluators. All of these pre-defined parameters provide precise and clear answers to some of the questions project development and project evaluation personnel must ask. Such parameters solve some of the system analyst's or system developer's questions concerning environmental considerations and constraints, as well as define the inputs, the outputs, and the boundaries of the project/system to be developed. All these characteristics of Title III projects collectively tend to provide a rational basis upon which an effective evaluation of Title III projects can take place. It is hoped that an understanding of the evaluation system depicted in Figure 1, which indicates the general role and position of evaluation in perspective with other Title III project related activities, will provide a valid rationale for systematic evaluation of Title III projects and Title III project related activities.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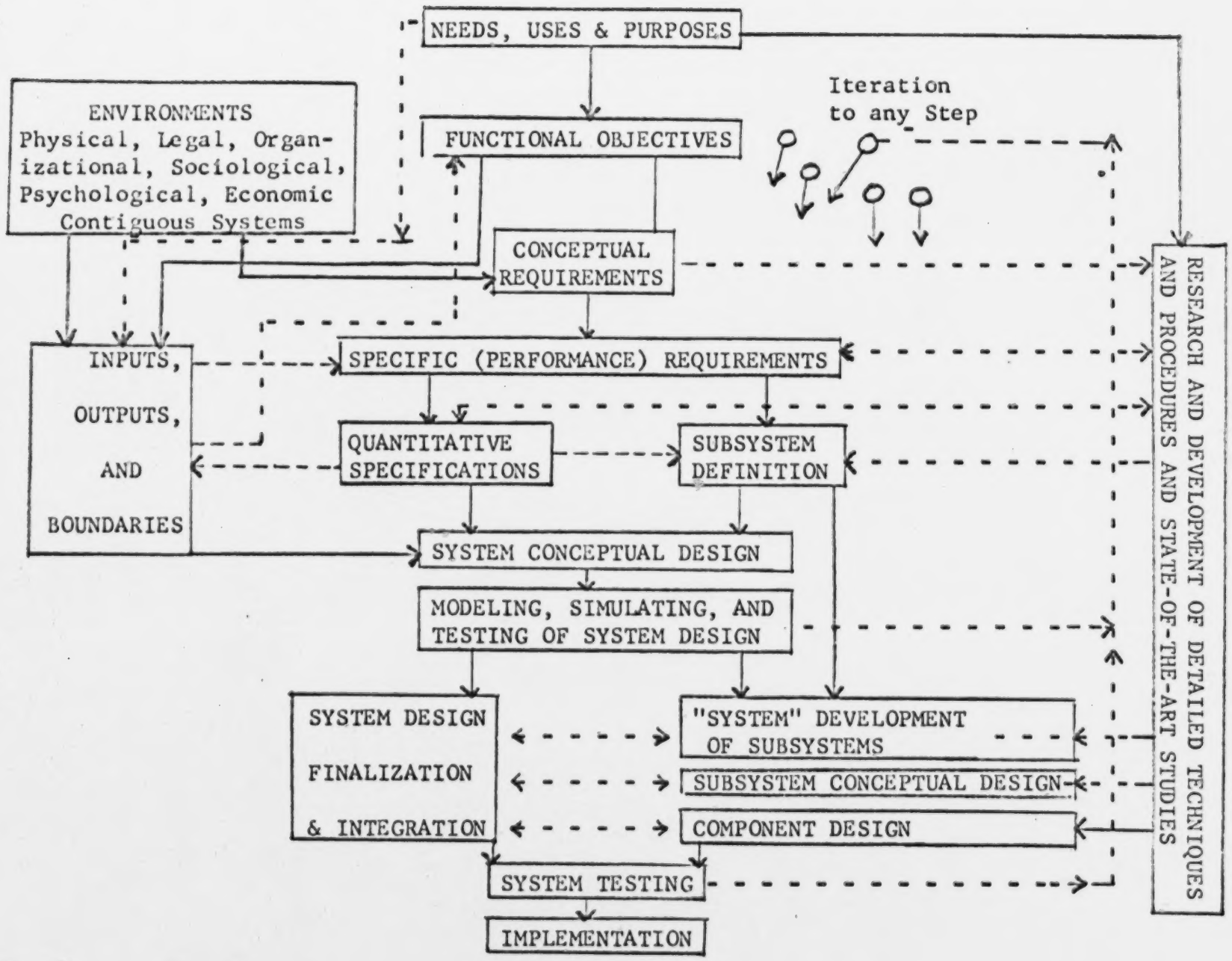
DETERMINE ELIGIBILITY FOR TITLE III FUNDS 3
REFINE STRATEGY FOR TREATMENT 8
DETERMINE STRATEGY FOR TREATMENT 4
IMPLEMENT PROJECT 9
DEVELOP INITIAL PROPOSAL 5
EXECUTE STEPS TO FULFILL OBJECTIVE(S) 10
PROCESS EVALUATION
DETERMINE OUTCOME OF EACH STEP 11
OUTCOME DESIRABLE? 12
NO: MODIFY 13.1
YES: COMPLETE PLANNED STEPS TO MEET OBJECTIVE(S) 13.2
PRODUCT EVALUATION
DETERMINE OUTCOME OF TREATMENT 14
OBJECTIVE(S) MET? 15
NO: REPEAT ACTIVITIES? 16.1
YES: FORMULATE ALTERNATIVES FOR FUTURE ACTIVITIES 17.2
NO: TERMINATE AND PREPARE FOR FUTURE ACTIVITIES 17.1
YES: CONTINUE PLANNED ACTIVITIES 16.2
YES: CONTINUE TO VALIDATE OUTCOME 16.3
- ACTIVITIES
- DECISION

FIGURE 1

EVALUATION IN PERSPECTIVE

FIGURE 2



------> Development of Problem Definition by Direct Inference

- - -> Use of Information

A SYSTEMATIC APPROACH TO SYSTEM DEVELOPMENT

(TECHNICAL OPERATIONS ONLY)

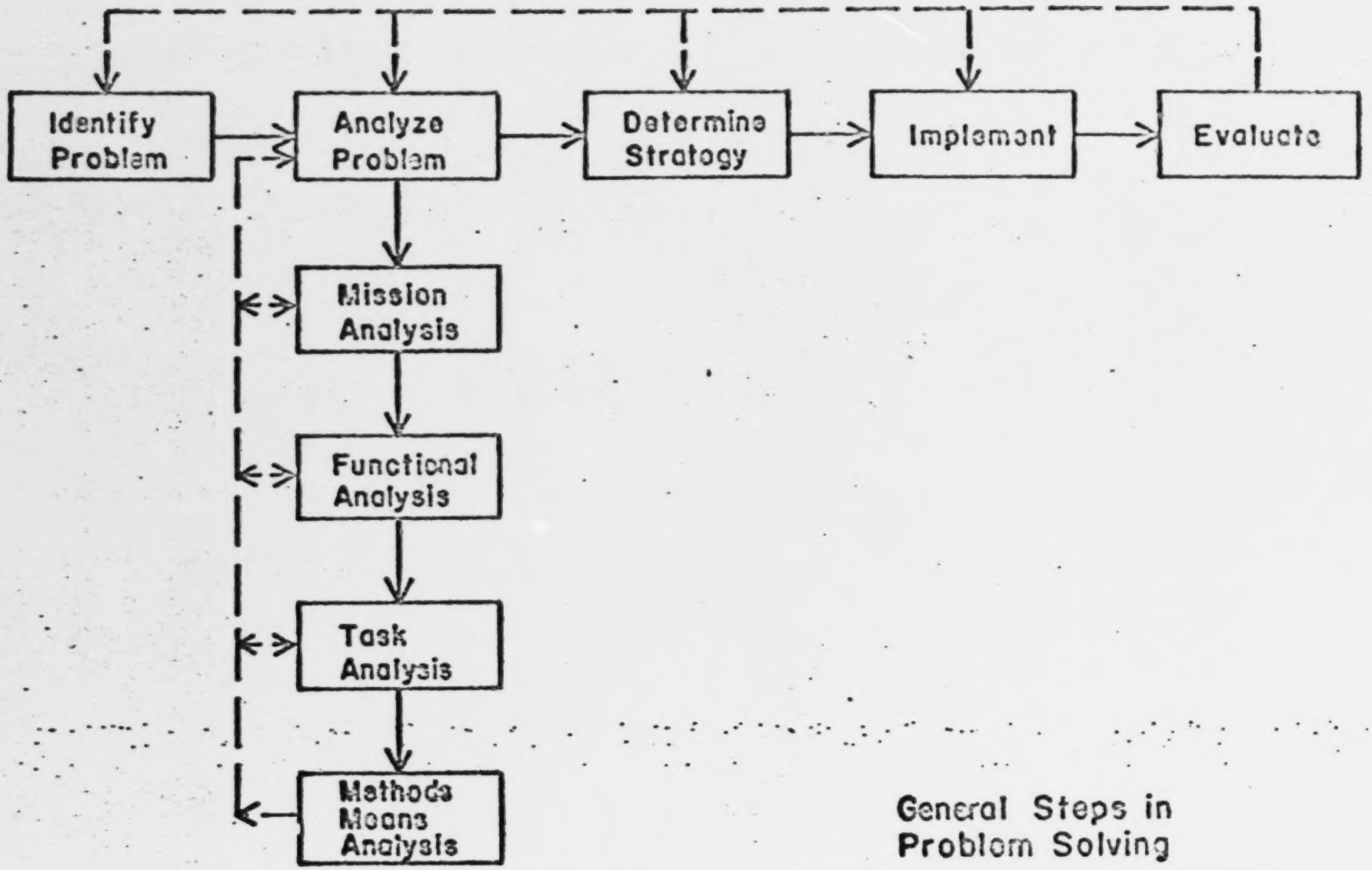


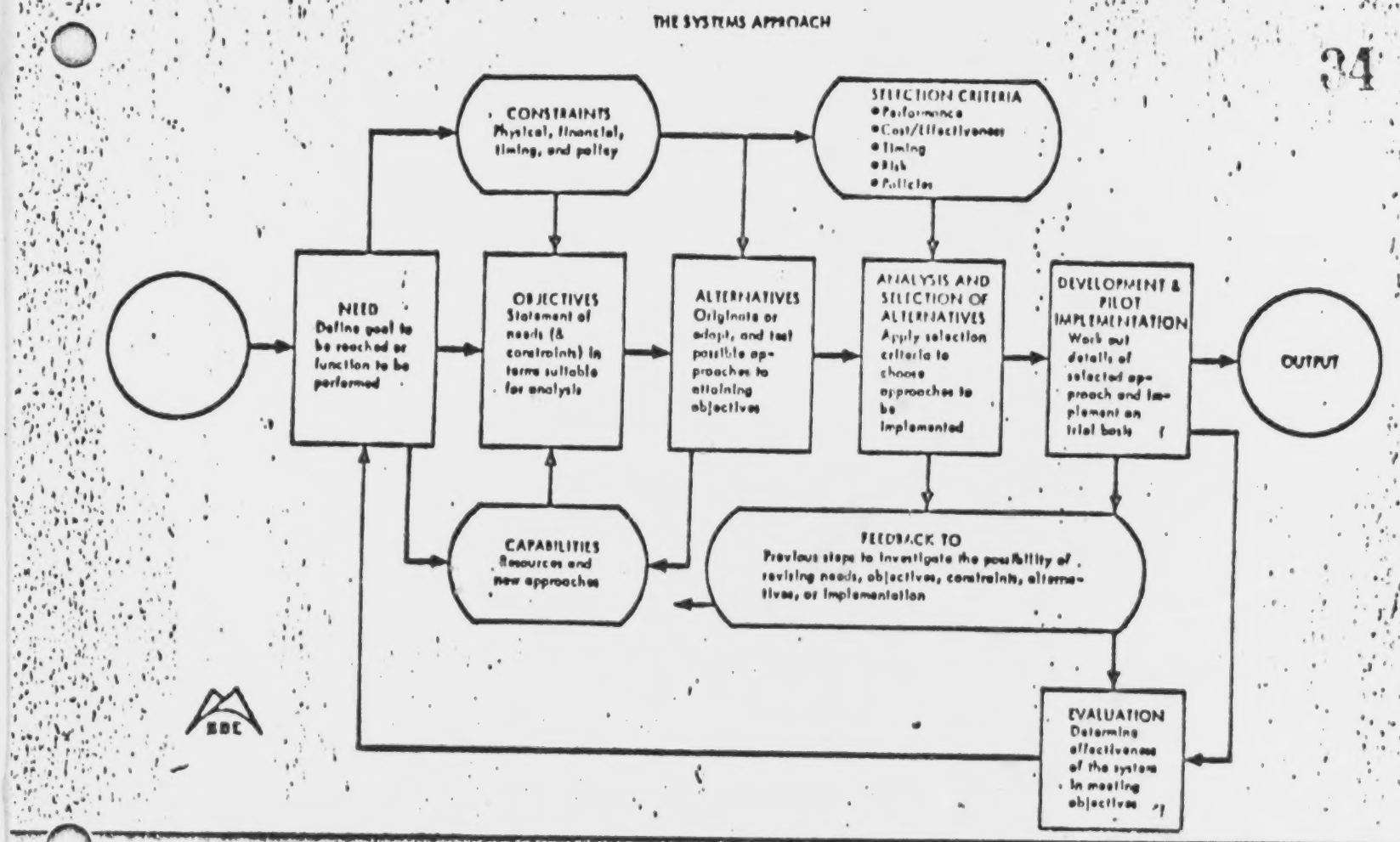
FIGURE 3

General Steps in Problem Solving

Using System Analysis Tools

R. Koufman & R. Corrigan 1/67

FIGURE 4


THE SYSTEMS APPROACH
CONSTRAINTS
Physical, financial, timing, and policy
SELECTION CRITERIA
• Performance
• Cost/Effectiveness
• Timing
• Risk
• Politics
NEED
Define goal to be reached or function to be performed
OBJECTIVES
Statement of needs (& constraints) in terms suitable for analysis
ALTERNATIVES
Originate or adopt, and test possible approaches to attaining objectives
ANALYSIS AND SELECTION OF ALTERNATIVES
Apply selection criteria to choose approaches to be implemented
DEVELOPMENT & PILOT IMPLEMENTATION
Work out details of selected approach and implement on trial basis
OUTPUT
CAPABILITIES
Resources and new approaches
FEEDBACK TO
Previous steps to investigate the possibility of revising needs, objectives, constraints, alternatives, or implementation
EVALUATION
Determine effectiveness of the system in meeting objectives
SDC

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SYSTEMS ANALYSIS

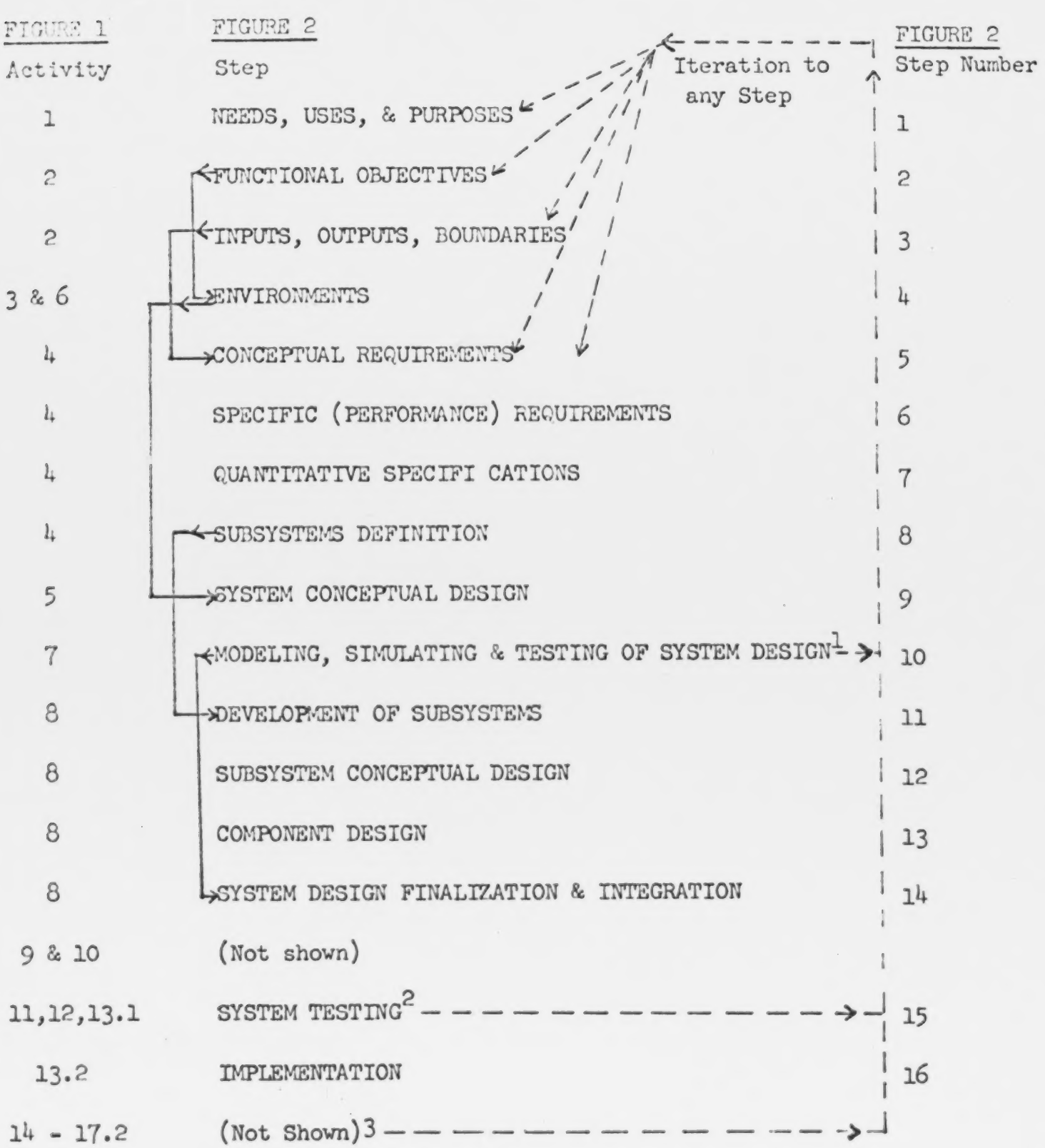
What, then, is systems analysis as it is used in military and space technology? About two years ago the National Security Industrial Association formed a number of working groups to examine the way in which military and space technology might be applied to the many problems in civilian society. One of the groups dealt with the systems approach to education.* This group formulated eight basic points which they felt characterized the typical application of the systems analysis to training problems, and suggested that the extension of this approach to civilian education would help significantly in improving our public education. Each of the eight points were described in considerable detail. The summary sentences for the points were:

1. State the real NEED you are trying to satisfy.
2. Define the educational OBJECTIVES which will contribute to satisfying the real need.
3. Define those real world limiting CONSTRAINTS which any proposed system must satisfy.
4. Generate many different ALTERNATIVE systems.
5. SELECT the best alternative(s) by careful analysis.
6. IMPLEMENT the selected alternative(s) for testing.
7. Perform a thorough EVALUATION of the experimental system.
8. Based on experimental and real world results, FEEDBACK the required MODIFICATIONS and continue this cycle until the objectives have been attained.

While these eight points may be typical of the activities in systems analysis, the list does not adequately convey the dynamic and continually iterative or feedback character of systems analysis. The diagram above emphasizes the continual examination of each step, the feedback to previous steps, and the consideration of various capabilities and limitations which influence the decisions made at each point.

*Task Group VI. Proc. of Project ARISTOTLE Symposium, NSIA, Washington, D.C., 1968.

FIGURE 5



RELATION BETWEEN ACTIVITIES IN FIGURE 1 AND STEPS IN FIGURE 2

[1] BASELINE EVALUATION SUBSYSTEM (Activities 1-7 of Figure 1; Steps 1-10 Figure 2)

[2] PROCESS EVALUATION SUBSYSTEM (Activities 8 - 13.1; Steps 11-15)

[3] PRODUCT EVALUATION (Activities 13.2 - 17.1; Steps not shown in Figure 2)